What Is Claimed Is:

1. A process for producing an improved catalyst comprising a mixed metal oxide having the empirical formula

$$Mo_aV_bN_cX_dZ_eO_f$$

wherein N is at least one element selected from the group consisting of Te and Sb,

wherein X is at least one element selected from the group consisting of Nb, Ta, Ti, W, Se, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu,

wherein Z is at least one element selected from the group consisting of Au, Ag, Re, Pr, Zn, Ga, Pd, Ir, Nd, Y, Sm, Tb, Br, Cu, Sc, Cl, F and I, and

wherein, when a = 1, b = 0.01 to 1.0, c = 0.01 to 1.0, d = 0.01 to 1.0, e = 0 to 0.1 and f is dependent on the oxidation state of the other elements, comprising:

(a) admixing compounds of elements Mo, V, N, X and Z and at least one solvent at a temperature greater than or equal to 45°C to form an admixture,

wherein Mo, V, N, X and Z are present in such amounts that the atomic ratio of Mo : V : N : X : Z is a : b : c : d : e, and, when a = 1, b = 0.01 to 1.0, c = 0.1 to 1.0, d = 0.01 to 1.0 and e = 0 to 0.1;

(b) removing said at least one solvent from the so-formed admixture to form a catalyst precursor; and

(c) calcining said catalyst precursor to obtain said mixed metal oxide.

2. The process according to claim 1, wherein e = 0.001 to 0.1.

3. The process according to claim 1, wherein said catalyst precursor is calcined in two stages, in a first stage, calcination is effected under an oxidizing atmosphere, and, in a second stage, calcination is effected under a non-oxidizing atmosphere.

4. The catalyst produced by the process according to claim 1.

5. A process for producing an unsaturated carboxylic acid which comprises subjecting an alkane, or a mixture of an alkane and an alkene, to a vapor phase catalytic oxidation reaction in the presence of a catalyst comprising a mixed metal oxide having the empirical formula

$$Mo_aV_bN_cX_dZ_eO_f$$

wherein N is at least one element selected from the group consisting of Te and Sb,

wherein X is at least one element selected from the group consisting of Nb, Ta, Ti, W, Se, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu,

wherein Z is at least one element selected from the group consisting of Au, Ag, Re, Pr, Zn, Ga, Pd, Ir, Nd, Y, Sm, Tb, Br, Cu, Sc, Cl, F and I, and

wherein, when a = 1, b = 0.01 to 1.0, c = 0.01 to 1.0, d = 0.01 to 1.0, e = 0 to 0.1 and f is dependent on the oxidation state of the other elements, prepared by the process comprising:

(a) admixing compounds of elements Mo, V, N, X and Z and at least one solvent at a temperature greater than or equal to 45°C to form an admixture,

wherein Mo, V, N, X and Z are present in such amounts that the atomic ratio of Mo : V : N : X : Z is a : b : c : d : e, and, when a = 1, b = 0.01 to 1.0, c = 0.1 to 1.0, d = 0.01 to 1.0 and e = 0 to 0.1;

(b) removing said at least one solvent from the so-formed admixture to form a catalyst precursor; and

(c) calcining said catalyst precursor to obtain said mixed metal oxide.

6. A process for producing an unsaturated nitrile which comprises subjecting an alkane, or a mixture of an alkane and an alkene, and ammonia to a vapor phase catalytic oxidation reaction in the presence of a catalyst comprising a mixed metal oxide having the empirical formula

$Mo_aV_bN_cX_dZ_eO_f$

wherein N is at least one element selected from the group consisting of Te and Sb,

wherein X is at least one element selected from the group consisting of Nb, Ta, Ti, W, Se, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu,

wherein Z is at least one element selected from the group consisting of Au, Ag, Re, Pr, Zn, Ga, Pd, Ir, Nd, Y, Sm, Tb, Br, Cu, Sc, Cl, F and I, and

wherein, when a = 1, b = 0.01 to 1.0, c = 0.01 to 1.0, d = 0.01 to 1.0, e = 0 to 0.1 and f is dependent on the oxidation state of the other elements, prepared by the process comprising:

(a) admixing compounds of elements Mo, V, N, X and Z and at least one solvent at a temperature greater than or equal to 60°C to form an admixture,

wherein Mo, V, N, X and Z are present in such amounts that the atomic ratio of Mo : V : N : X : Z is a : b : c : d : e, and, when a = 1, b = 0.01 to 1.0, c = 0.1 to 1.0, d = 0.01 to 1.0 and e = 0 to 0.1;

(b) removing said at least one solvent from the so-formed admixture to form a catalyst precursor; and

(c) calcining said catalyst precursor to obtain said mixed metal oxide.